

Having thus described the invention, what is claimed is:

1. An electrical inter-connection system comprising:

a circuit board substrate having a first surface and a second surface, said
5 substrate including a through-hole extending between said first surface and said
second surface;

a first conductive pad disposed on said first surface and positioned
substantially adjacent said through-hole;

a conductive terminal having a first end and a second end, said conductive
10 terminal extending through said through-hole such that each of said first end and
said second end is exposed for electrical inter-connection with a respective
mating element; and

a conductive bonding agent electrically connecting said conductive terminal
with said first conductive pad.

15

2. An electrical inter-connection system as recited in claim 1, further
comprising:

a conductive plating in said through-hole, said conductive plating being
electrically connected with said conductive bonding agent.

20

3. An electrical inter-connection system as recited in claim 2, further
comprising:

a second conductive pad disposed on said second surface substantially adjacent said through-hole, said conductive bonding agent electrically connecting said terminal with said second conductive pad.

5 4. An electrical inter-connection system as recited in claim 3, wherein said conductive bonding agent comprises solder.

5. An electrical inter-connection system as recited in claim 4, further comprising:

10 a dielectric housing having a body and at least one stand-off, said terminal being positioned in said housing, said at least one stand-off being mounted on said first surface, said body being located a sufficient distance from said circuit board to enable a solder fillet to form between said conductive terminal and said first conductive pad.

15

6. An electrical inter-connection system as recited in claim 1, wherein each of said first end and said second end extends at least about 2 mm beyond said respective first and second surface of said circuit board substrate.

20 7. An electrical inter-connection system comprising:

a dielectric housing having a body and at least one stand-off, said body having a board mounting face and an opposed mating face, said at least one stand-off extending from said board mounting face;

a conductive terminal positioned in said housing, said terminal having a first end extending outwardly from said board mounting face and a second end extending outwardly from said mating face;

5 a circuit board substrate having a first surface and a second surface, said substrate including a through-hole extending between said first surface and said second surface, said first end of said terminal extending through said through-hole and beyond said second surface of said substrate for electrical connection with a mating element, said stand-off engaging said first surface of said substrate providing a gap between said board mounting face and said first
10 surface of said circuit board substrate;

a first conductive pad disposed on said first surface substantially adjacent said through-hole; and

a conductive bonding agent electrically connecting said terminal with said first conductive pad.

15

8. An electrical inter-connection system as recited in claim 7 further comprising:

a conductive plating in said through-hole which extends between said first and second surfaces, said conductive bonding agent being electrically connected
20 with said conductive plating.

9. An electrical inter-connection system as recited in claim 8 further comprising:

a second conductive pad disposed on said second surface substantially adjacent said through-hole, said conductive bonding agent electrically connecting said terminal with said second conductive pad.

5 10. An electrical inter-connection system as recited in claim 9, wherein said conductive bonding agent comprises solder.

10 11. An electrical inter-connection system as recited in claim 7, wherein said first end of said terminal extends at least about 2 mm beyond said second surface of said circuit board substrate.

15 12. An electrical inter-connection system comprising:
a circuit board substrate including at least one aperture, said aperture being defined by a sidewall having a conductive surface; and
a conductive body having at least one protrusion extending from a base, said protrusion engaging two spaced-apart portions of said sidewall upon inserting said protrusion in said aperture, and once inserted, said protrusion being seized within said aperture at said two spaced-apart portions with an interference fit between said protrusion and said two spaced-apart portions.

20

13. An electrical inter-connection system as recited in claim 12, wherein said aperture has an eccentric shape.

14. An electrical inter-connection system as recited in claim 13, wherein each of said two spaced-apart portions comprise a flat surface.

15. An electrical inter-connection system as recited in claim 14, wherein
5 said protrusion has a generally cylindrical shape,

16. An electrical inter-connection system as recited in claim 15, wherein said circuit board substrate has a first surface and opposing second surface, said aperture extending between said first and second surfaces.
10

17. An electrical inter-connection system as recited in claim 16, wherein said aperture is shaped as a slot having a length and a width.

18. An electrical inter-connection system as recited in claim 17, wherein
15 the difference between said slot width and said protrusion diameter is between 1.5% and 20% of said slot width.

19. An electrical inter-connection system as recited in claim 12, wherein said protrusion has a draft angle between 1 and 3 degrees.
20

20. A method of forming an electrical connection in a through-hole defined in a circuit board substrate, comprising:

- providing a circuit board substrate having first and second surfaces, a through-hole extending between said first and second surfaces;
- providing a conductive terminal having first and second ends;
- providing a first conductive pad on said first surface of said circuit board
- 5 substantially adjacent said through-hole;
- placing a conductive bonding agent on said first conductive pad;
- placing said terminal into said through-hole such that said first end is exposed for electrical connection with a mating element on said first side of said circuit board and said second end is exposed for electrical connection with a
- 10 mating element on said second side of said circuit board; and
- re-flowing said conductive bonding agent causing it to flow into said through-hole so that it electrically connects said terminal with said first conductive pad.
- 15 21. A method as recited in claim 20, wherein said conductive bonding agent comprises solder.
22. A method as recited in claim 20, further comprising the step of providing a second conductive pad on said second surface of said circuit board
- 20 substantially adjacent said through-hole;
- wherein said step of causing said bonding agent to flow further includes causing said conductive bonding agent to flow through said through-hole such that it electrically connects said terminal with said second conductive pad.

23. A method as recited in claim 20, further comprising the step of placing a stencil over said through-hole prior to said step of placing a conductive bonding agent on said first conductive pad to prevent said conductive bonding agent from being placed in said through-hole and said method further comprises the step of removing said stencil prior to said step of placing said terminal into said through-hole.

24. A method as recited in claim 20, further comprising the step of providing a pin block, said pin block comprising a dielectric housing having a body and at least one stand-off, said body having a board mounting face and an opposed mating face, said at least one stand-off extending from said board mounting face, said method further comprising the step of positioning said terminal in said pin block such that said first end extends through said body between said board mounting face and said mating face, and wherein said placing said terminal into said through-hole further comprises placing said at least one stand-off on said first surface of said circuit board substrate, wherein said body being located a sufficient distance from said circuit board to enable a solder fillet to form between said conductive terminal and said first conductive pad.

25. A method as recited in claim 20, wherein said through-hole includes a plating extending between said first and second surfaces of said circuit board.